DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
SOUTHERN REGION
Atlanta, Georgia

SPECIFICATION NO. FAA-SO-42354
DATED: January 10, 2012

SPECIFICATION FOR the WATERPROFING OF THE AIR TRAFFIC CONTROL TOWER & BASE BUILDING AT SANFORD AIRPORT, SANFORD, FLORIDA

FAA-SO-42354
January 12, 2012

DIVISION 1 GENERAL REQUIREMENTS
SECTION 1A
SUMMARY OF THE WORK

1A.1 GENERAL: The work described hereunder consists of furnishing all necessary materials, labor, equipment, tools, and supervision to Water proof the Air Traffic Control Tower (ATCT) and Base Building at Central Florida Regional Airport Sanford Airport, Sanford, Florida.

1A.2 SCOPE OF WORK: The work consists of but is not limited to the following:

Some work must be done during a time when it does not interfere with the performance of the duties of the controllers at this facility. It is required that the interior, cab and catwalk work be done after operational hours (11PM-6AM). This project has a Base Bid and Option Bid "alternate A" if funds are available.

Catwalk and Interior Work:

1. All the exterior catwalk floor with elastomeric coating needs to be removed, replace around the cab-catwalk area and install removable plugs for 1.5" dia pipes at the catwalk area.

2. Remove, replace and terminate appropriately the designated damaged drywall areas at the first floor entrance base building area and ATCT around the a-c unit. Prime, Paint.

Columns
- Remove existing drywall and materials down to solid substrate.
- Apply a corrosion inhibitor to the areas that are displaying rust.
- Install new 5/8" gypsum board (GWB) around the column.
- Paint to match existing area.

Ceiling
- Grind surface of metal plate down to non-corroded metal.
- Apply a corrosion inhibitor to the visible surface of the metal plate.
- Install new 24" square lay-in ceiling tiles to match existing.
- Replace all the ceiling tiles of the entrance, hallway of the base building and replace the damaged, stained ceiling tiles at the different floors at the

tower. The contractor should leave two unopened boxes as spares.

Stairwell:

- Replace/Repair drywall at tower stairwell Exit.
- Remove damaged drywall.
- Replace with 5/8" GWB.
- Sand and paint surface.
- Reference paint Spec on Page 53.

Tower Shaft (part of the alternate)

- Replace 5/8" GWB drywall at each of the intermediate levels in the tower shaft around each of the windows.
- Paint surfaces to match existing.
- Install wallpaper in areas where applicable.
- Warped ¾" plywood stool above AC unit will need to be replaced with similar.
- Apply two coats of poly-urethane coating over surface.
- Remove and reinstall the ceiling grid that is being affected by the damage drywall areas.
- clean paint the catwalk access door.

Base Building:

1. Remove and reinstall lighting protection from the base building roof.
2. Remove and replace the designated wet roof insulation areas at the base building roof.
3. Remove the membrane from the parapet wall and existing cap.
4. Install a thermoplastic with felt back mechanical attached roof system with a design speed warranty of 120 mph.
5. Install fully adhered thermoplastic membrane on the parapet wall and cover it with membrane coated metal cap with all seams heat welded.
6. Install walkway pad in the same area as the existing.
7. Remove and replace allflashing with fully adhered membrane flashing per manufacturer recommendations.
8. Replace the existing metal coated insert drain scuppers with new coated metal drain scuppers.

Cab Roof:

1. Clean existing roof surface, Remove and reinstall the lightning arresters, associated clamps and cables on cab roof.
2. Prepare existing surface for application of mechanically fastened membrane by slicing the existing membrane to release any stress.
3. Furnish and install 80 mils mechanically attached, single-ply, PVC roof system with felt back, on top of existing single ply membrane. Included in the re-cover are all flashings,

sealants, adhesives, walkway pads, and other components to comprise a complete roofing system.
4. Remove and dispose of existing parapet wall membrane and replace it with thermoplastic fully adhered membrane.
5. Install an 80 mils Thermoplastic mechanical with felt back attached roof system with a design speed warranty of 120 mph with a 20 year warranty.
6. Install two PVC coated insert drains.
7. Install walkway pad in the same pattern as the existing.

Alternate A

The A-C Package Terminal Heat Pump (PTHP): (Six Floors)

1. Replace PTHP with new units that properly fit the space with sufficient depth that they touch the exterior louver to close the gap between the PTHP and the louver. If a unit of this depth is not available, then fabricate a sheet metal extension to the back of the PTHP to extend to the back of the louver. Apply thick gasket material to back perimeter edges of PTHP or sheet metal extension to seal gap between PTHP and louver.

2. During replacement of PTHP, inspect louver for proper fit and sealing in the exterior wall. If it is a drainable type louver with a catch pan or gutter, verify that it does drain properly to the outside.

3. Install an aluminum metal closure on the interior side to cover the entire louver opening. Finish the side facing the exterior to match the louver finish. Before installing, cut holes in the aluminum closure to match the size and location of the air openings for the PTAC unit. Apply mastic around all edges and fasten with stainless steel sheet metal screws around the perimeter. Seal the aluminum closure rain tight.

4. Any damage to the drywall around the A-C unit needs to be repaired and primed/-painted.

1A.3 COORDINATION: All coordination between the Contractor and the FAA shall be through the Contract Officer (CO).

1A.4 TEMPORARY FACILITIES: The Contractor shall furnish all temporary facilities as required such as electricity, water, and air.

1A.5 SANITARY FACILITIES: Sanitary facilities are not available at the site. The contractor shall provide temporary toilet facilities as required for his workmen. Temporary toilet facilities shall be of the type approved by the local governing body. The

location of the toilet facilities shall be as directed by the Resident Engineer.

1A.6 MATERIALS: The Contractor shall furnish all materials, equipment, and labor to complete the job, unless otherwise specified.

1A.7 MATERIAL STORAGE: The Contractor shall store all materials in a manner to protect them from all elements of the weather and other incidental damage. Materials shall be stored as directed by the Resident Engineer.

1A.8 INGRESS AND EGRESS TO WORK AREAS: Ingress and egress to the work areas shall be as directed by the Resident Engineer. Security passes will be required of all workmen. Information on how to obtain these passes will be available at the pre-construction conference. The Contractor shall keep all vehicles, working equipment and materials where directed by the Resident Engineer.

1A.9 CLEANING:

A. Working Area: The Contractor shall keep the working area in a clean and proper condition. All rubbish and waste resulting from the execution of the work shall be removed at the end of each day or stored as directed by the COR.

B. Waste Packing Material: Immediately after unpacking, all packing material, case lumber, excelsior, or other rubbish, flammable or otherwise, shall be removed from the building and the premises.

C. Final Clean-Up: Upon completion of work, and before final inspection, the Contractor shall remove his working tools, equipment, debris, rubbish, and unused materials from the building site.

D. Disposal: Disposal of rubbish, and debris will be off the site at Contractor's expense or as directed by the Resident Engineer.

1A.10 CONTRACTOR'S LIABILITY: Damage to existing facilities and equipment caused by the Contractor shall be reported to the Resident Engineer without delay. The Contractor will be responsible for repairing, or having repaired, all damaged areas or equipment at the Contractor's expense. All repairs shall be accomplished to the satisfaction of the Resident Engineer.

The Contractor shall keep all his working personnel within the work area or in approved access routes.

1A.11 SITE VISIT: The Contractor shall visit the work site prior to bidding the job to verify all dimensions and quantities of materials as specified and to obtain first-hand knowledge of existing conditions.

1A.12 PERMITS: The Contractor shall be responsible for obtaining all permits required to complete the job.

1A.13 PRE-CONSTRUCTION CONFERENCE: The Contractor shall attend a pre-construction conference prior to starting work at a location agreed upon between the Contractors and the Contracting Officer.

1A.14 WORKMANSHIP: All work shall be accomplished by experienced workers in accordance with the highest standards of the various work trades involved.

1A.15 FACILITY OPERATION: The antennas located on the cab roof provide communication for live air traffic, are of the highest importance, and shall not be disturbed. Prior to commencing work, the Contractor shall coordinate with the Resident Engineer to make all of the Contractor's personnel aware of these antennas and their importance.

1A.16 RESTRICTED USE OF ASBESTOS CONTAINING MATERIAL (ACM):

A. Requirements: Contractor shall not use any asbestos containing material (ACM) at any time during the construction process. Contractor shall verify that all material, including that from third party suppliers, is asbestos free materials. The Contractor shall provide a written letter of certification to the FAA, stating that the project is asbestos free.

The Contractor shall provide to the Contracting Officer (CO) a signed statement stating that, to the best of his/her knowledge, no asbestos containing building materials were used during the construction, renovation, and/or modernization of this facility.

If the FAA suspects the presence of ACMs, the FAA will sample the suspect material to verify that no ACMs were utilized. The testing shall be performed at the expense of the FAA. If ACMs are

subsequently found during the sampling of the building materials, the Contractor shall remove and replace the product or material at his/her expense. In addition, the Contractor shall incur the costs of the original testing and/or any re-testing that may be necessary.
The Contractor shall submit to the CO prior to construction, Material Safety Data Sheets (MSDS), for all materials and/or products to be utilized on the project. During the course of the project, both the RE and the Contractor shall routinely check products utilized on-site to ensure only products which have a submitted MSDS are used. Copies of all MSDS shall be turned over to the FAA office for their records.

If the Contractor does not submit the required information described above, the FAA shall have a complete building survey performed by a qualified testing firm prior to acceptance. The cost of the survey and any subsequent removal/replacement of any ACMs shall be deducted from the Contractor's payment.

An asbestos control work permit will be issued by the FAA for all monitoring and clean-up.

B. Stop Work Fiber Levels: A stop work order will be issued by the Resident Engineer when the concentration of fibers exceeds a value of 0.01 fibers per cubic centimeter in the cab. Work activities will be allowed to resume only after the asbestos concentrations reach 0.01 fibers per cubic centimeter or less, as determined by the Air Monitoring Technician, and the source of the disturbance has been determined and alleviated. At no time will a stop work order of this nature be grounds for the Contractor to file claims against the FAA for lost time.

1A.17 FACILITY OPERATION: Working around and above the cab window frame, and on the catwalk surrounding the cab, requires coordination with Air Traffic personnel so as to cause no disruptions to air traffic. Prior to commencing work, the Contractor shall coordinate with the Resident Engineer to make all of the Contractor's personnel aware of these requirements and their importance.

Even when sufficient advance notice is received from the Contractor and agreed to at that time, the FAA can

make no guarantees for opportunities to proceed with the work. Every effort will be given the Contractor to accommodate the work schedule, but some delay could be anticipated.

SECTION 1B
WORK SCHEDULE

1B.1 WORK SCHEDULE:
Normal working hours will be eight-hour days, Monday through Friday, with a start time agreed upon at the pre-construction conference. Some of the interior work will be done after hours trying to reduce noise level to ATCT personnel. For bid purposes the interior work and catwalk demolition will be done at night(11PM-6AM). Contractor shall submit a work schedule for approval prior to beginning work. The Contractor shall keep the Resident Engineer advised daily of any change.

SECTION 1C
SUBMITTALS

1C.1 SUBMITTALS AND BRAND NAME USAGE

Submittals Prior to Contract Award Shall Include:

1. Letter from the proposed primary system manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.

2. Letter from the primary system manufacturer stating that the proposed application will comply with the manufacturer's requirements in order to qualify the project for the specified guarantee.

A. Introduction: Each product required for use in the Contract drawings and Specifications must meet the actual minimum needs of the Government as demonstrated in the salient characteristics for that product. If a brand name product is used in the drawings or Specifications, it should be regarded as a "known acceptable source". The use of the term "known acceptable source" and "brand name or equal" in referencing a specific product or manufacturer is not intended to indicate a preference for the products mentioned, but indicates the quality and characteristics of products that will meet the Government requirements. Should the Contractor decide to use a product other than that identified as a "known

acceptable source” or “brand name or equal”, the Contractor shall provide a submittal for this product. This does not relieve the Contractor from providing submittals for products or materials required in other sections of this Specification.

A brand name product or known acceptable source mentioned is not required for use unless the drawings and Specifications make it clear that the brand name product is required, and substitution is prohibited.

B. Requirements: Each product that a Contractor wishes to use that is not a known acceptable source, must be approved before use, by the Contracting Officer or his/her designee. To gain approval, the Contractor must submit documents and/or samples that will demonstrate the product clearly will meet the Government's minimum needs, and demonstrates appropriate salient characteristics. All submittals must be in writing. The information presented in a submittal shall be sufficient to demonstrate that all specification requirements for the subject material, equipment, methods, or plans, are met by the Contractor's proposal.

The Contractor shall submit for approval samples of each material to be used in the roof system, including each component manufacturer’s literature and applicable MSDS. This is to include (but not limited to) applicable product literature, sample guarantee, detailed drawings of proposed flashing applications where they will differ from the project drawings, and fastening for insulation and membrane. Deviations from contract drawings and specifications shall be submitted in writing to the Contracting Officer prior bid opening for approval by the Project Engineer. The Contractor, as part of the bid, shall submit to the Contracting Officer a company "Site Health and safety Plan" for review and approval.

A. Submittal Review: Contractor shall send the submittal package(s) directly to the Contracting Officer. The submittal will return directly from the Contracting Officer to the Contractor, with the Contracting Officer's approval, approval with comments, or disapproval.

D. Submittal Approval Time Frame: To provide adequate time for document review, the FAA reserves the right to take the necessary time to complete a review. It should be anticipated that the review period may be two weeks, although every effort will be made to expedite this process.

E. Procurement Before Approval: The Contractor is advised not to procure any item for which submittal approval is required but not yet granted. If approval is denied, the Contractor will not be paid for the disapproved item(s). The Contractor must transmit a new submittal package for the new items replacing the disapproved items, and must procure only approved items. The Contractor shall take responsibility for any items purchased, fabricated, or delivered before submittal approval is granted.

DIVISION 7 – THERMAL AND MOISTURE PROTECTION
SECTION 7A
INSULATION

7A.1 SCOPE OF WORK: Replace insulation in designated area of the Base building roof. Replace the isocyanurate insulation board cricket and dens deck cover board with thickness and slope to match existing surface.(It is recommended that the contractor do core sample before ordering the replacement material)

7A.2 MATERIALS: Fasteners and insulation boards shall be approved by the membrane manufacturer. The Contractor shall supply samples and brochures to the Contracting Officer for approval.

A. Fasteners: Fastener length shall be field determined by the Contractor, ensuring at least a 1 inch penetration of the steel roof decking. Fasteners shall meet the Factory mutual Specification #4470. Recommended Source: Roofgrip fasteners, S-12, #12 diameter, by "Buildex".

B. Distribution Plates: The distribution plates shall be three inch diameter corrosion resistant metal plates, meet FM#4470, and are made from Galvalume metal. The only acceptable plastic plate is Gearlock Plastic made from high strength Polyolefin, with special design features that positively lock the fastener's head into the plate. This plastic plate is manufactured by Buildex. No substitutions will be allowed for plastic plates unless the roofing manufacturer warrantees it. The Contractor is required to submit from the roofing manufacturer, their approval to use this plate and that the plate meets all their requirements.

C. Rigid Insulation Board: Polyisocyanurate foam core bonded to a glass fiber mat facers and approved by the membrane manufacturer for a mechanically attached membrane system meeting the Factory Mutual I-90 uplift requirement. The rigid insulation sheets shall be 4 feet by 4 feet have an average R value of 22.2 using the ASTM C518 test at 75°F. The insulation must meet the following typical physical properties:

Property	Test Method	Typical Results

Dens., Overall	ASTM D 1622	2.0 pcf (nom.)
Comp. Strength	ASTM D 1621	20 psi
Flame Spread	ASTM E 84	25 or less
Moisture Vapor Transmission	ASTM E 96	Less than 1 perm.
Dim. Stability	ASTM D2126	Less than 2% linear change
Service Temp.	----	-40°F to +250°F

The Contractor shall have the roofing membrane manufacturer's approval and the Contracting Officer's approval prior to ordering the insulation material.

Two manufacturers and insulation materials that are acceptable to the FAA and meet the typical physical properties are as follows:

NRG ENERGY 1 with MG 1279 or GAF ULTRA Facers
RMAX MULTIMAX FA with GAF ULTRA Facer

7A.3 INSTALLATION: Install insulation sheets using the appropriate fasteners and distribution plates as specified in paragraph 7A.2 and as shown on the drawings. The fastener location pattern shall be approved by the manufacturer and meet the uplift and wind loading requirements.

The insulation joints shall not be wider than 1/8". When insulation is cut to fit irregular shapes, the insulation shall be cut to fit the desired shape accurately with true square edges. The insulation layers shall be fastened to the steel deck using deck screws and stress plates driven through and engaging the steel deck. The layout, number of fasteners and pattern recommended by the rigid insulation manufactured and membrane manufacturer must be complied with for a mechanically fastened-engineered roof system.

SECTION 7B
SINGLE-PLY PVC ROOFING MEMBRANE

7B.1 SCOPE OF WORK: The work covered by this section is for an engineered bar system mechanically attached, 080 inch thick with polyester felt back, single-ply Polyvinyl Chloride (PVC) membrane, with hot air welded seams.

7B.2 MATERIALS:

A. Single-Ply Membrane: Membrane shall be reinforced flexible PVC sheeting, .080 inches thick, conforming to the ASTM D4434 (latest revision) "Standard for Polyvinyl Chloride Sheet Roofing." PVC membrane used for flashing shall be fully adhered with hot-air welded joints. The roofing system shall include compatible flashing, caulking, etc., as recommended by the roofing manufacturer. Engineered System by Sika Sarnafil, Canton, MA 02021

The proposal of a different system requires the following Contractor submittals:
Roofing system manufacturer's catalog and specification data, complete with materials descriptions, detailed application instructions, standard installation drawings, detailed drawings where applicable, walkway material details, product characteristics, physical properties, and a copy of the 20 year warranty. The warranty shall be without any financial limitation in case of roof replacement. Also, the manufacturer shall submit a roof plan showing the seams and bar location for the roof system that will conform to the requirements and withstand 120 mph wind loading. Felt back can be replace with .25 dens deck mechanically attached. Engineered System by Sika Sarnafil, Canton, MA 02021

Acceptable substitution: 50 mils KEE Fibertite at XT 20 year's warranty, 120 mph wind warranty. Seaman Corpration(Fibertite), Wooster, Ohio 44691

As manufactured, the membrane shall conform to the following physical properties:

Table 1

Salient Characteristics of Reinforced
Single-ply Polyvinyl Chloride (PVC) Membrane

Parameters	Test Method	Typical Properties
Reinforcing Mat'l	---	Polyester
Overall Thk. mm (in)	D751	2.03 (.080)
Breaking Str., lbf/in	D751	230
Elong. at Break, min. %	D751	20%
Seam Strength* (% of Breaking Str.)	D751	85%
Retention of Props. after Heat Aging	D3045	----
Breaking Strength (% of Original)	D751	95%
Elongation, min. (% of Original)	D751	90%
Tear Resistance (lbf)	D751	50
Low Temp. Bend (-40°F)	D2136	Pass
Accelerated Weath. Test (Xenon)	D2565	10,000 Hours
Cracking	----	None
Discoloration	----	Negligible
Crazing	----	None
Linear Dim. Change	D1204	.1%
Weight Change After Immersion in Water	D570	2.5%
Static Puncture Resist, 33 lbf	D5602	Pass
Dynamic Puncture Resist, 14.7 ft-lbf	D5635	Pass

*Failure occurs through membrane rupture, not seam failure.

B. Separation Layer: Separator used to isolate new roofing materials from existing roofing membrane shall be a .0135 unsaturated polyester felt, having a minimum Mullen burst strength of 210 pounds. A known acceptable product is Sarnafelt.

C. Flashing Material:

1. Base and counter flashing material shall be "PVC metal", 25 gauge galvanized steel, coated with a 0.021 inch coating of PVC film or equal. This material shall be used on the parapet walls, and

walls as required on the drawings. Flashing color shall match roofing membrane.

2. Flashing for the curbs and other details shall be made from PVC fiberglass reinforced membrane, a minimum of .048 inches thick. Flashing color shall match roofing membrane.

3. Asphalt resistant membranes such as Sarnafil membrane G459 (.060 inches thick) or equal, can be used for flashing around and under the roof drain clamping rings and other areas where there could be contact with asphalt.

D. Protection Mat: The Contractor shall install polyester-reinforced walkway tread made from PVC membrane, 0.096 inches thick. The walkway tread shall protect the roofing membrane from mechanical abuse in the walkways. Sarnatred is a known acceptable source.

E. Adhesives:

1. Sarnafil Sarnacol 2121 water-based, elastomeric adhesive, or equal, shall be used to attach the PVC roofing membrane to the substrate specified
2. Sarnafil Sarnacol 2170 solvent-based, elastomeric adhesive, or equal, shall be used for roof flashings only if deemed necessary by the Resident Engineer.

F. Fasteners: All exposed screws, fasteners or miscellaneous hardware shall be stainless steel alloy, bronze, PVC coated steel, hot dipped galvanized, or similar corrosion resistant material approved by the Project Engineer.

G. Bar: 14-gage, "U" shape, roll formed, corrosion resistant steel bar. This is being used to mechanically attach the single ply membrane. The bar shall be fastened 8" O.C., or the recommended spacing by the manufacturer.

H. Sealants (Caulking): Caulking shall be chemically compatible with the PVC flashing membrane. The following caulks/sealants are accepted based on chemical compatibility with PVC membranes.

1. Sonneborn NP-1 by Chemrex, Inc.
2. Silpruf by General Electric Co.

3. Vulkem 116 by Mameco International
4. Vulkem 921 by Mameco International
5. NP1
6. PTI-404 by Protective Treatments, Inc.
7. ACRYL-R S-M5522 by Schnee Morehead
8. SM-205 by TACC International
9. Tremseal-S by Tremco
10. Mono by Tremco
11. Multipurpose Sealant by Sarnafil, Inc.

I. Caulking For Drain. Apply Tremco Poly Roof, or approved equal, in the roof drain bowls to seal the underside of the PVC material used to line the roof drains.

7B.3 WEATHER LIMITATIONS: Roofing or insulation materials shall not be applied until the ambient temperature is 50°F with no signs or forecast for rain. Roofing materials shall not be applied when there is excessive moisture in the air causing wet or damp surfaces.

7B.4 QUALITY ASSURANCE: The roofing system shall be Factory Mutual approved for use over metal roof deck, Class I roof construction, and shall have 120 mph windstorm resistance classification. The roof system shall warranted by the manufacturer to withstand at least 120-mph winds.

7B.5 PRODUCT DELIVERY AND STORAGE: All products delivered to the site shall be in original unopened containers. Store membrane rolls lying down, fully protected from moisture. Bonding adhesives shall be stored at a temperature above 40°F. All stored materials shall be protected from damage during construction by the Contractor.

7B.6 MEMBRANE INSTALLATION:

A. Inspection: Contractor shall examine the surface scheduled to receive the membrane for defects that will adversely affect the execution and quality of work.

B. Preparation: The surface to receive the membrane shall be dry and free from dust or loose particles which would interfere in obtaining proper and adequate bond? Score the existing membrane along the perimeter of the parapet wall and at all penetrations, as well as the six radial lines that emanate from the parapet wall.

C. Substrate Preparation.

1. A proper substrate shall be provided to receive the membrane and mechanically attached system.

2. The Contractor shall inspect the roofing surface for defects such as excessive surface roughness, contaminated surfaces, structurally unsound substrates etc., that will adversely affect the quality of work.

3. The substrate shall be clean, smooth, dry, free of flaws, sharp edges, loose and foreign material, oil and grease. Roofing shall not start until all defects have been corrected.

D. Installation:

1. Unroll the roof membrane over the properly installed and prepared substrate surface. Overlap adjacent sheets with the manufacturer's minimum overlap required for bar attachment and welding techniques.

2. Place bars as indicated on drawings and/or manufacturer's design.

3. Bars and PVC cord are to be used at the base of curbs, parapet walls and penetrations.

4. Install an 8-inch cover strip over each bar and then hot-air welds on both sides.

5. Bar installation shall be positioned at proper intervals according to an approved layout using the manufacturer calculations. A ¼-inch gap shall be left where bar ends meet to accommodate expansion and contraction. The bar shall be secured at an approved fastener spacing. Fasteners shall be no more than 3 inches from the ends of each bar. An additional 4-inch square piece of membrane shall be welded over the tops of bars where the ends meet.

6. Around all perimeters, at base of walls, drains, curbs, vent pipes, or any other penetration protruding through the roof, bars shall be installed. Where bars meet a ¼-inch gap must be allowed for expansion and bar ends are covered with 4-inch strips of membrane.

7. A 4-mm PVC cord shall be welded on the penetration side of the bar to prevent tearing through of the roof membrane.

8. Hot-air weld overlaps according to manufacturer's recommendations.

9. The membrane is to be attached with accepted fasteners and bars according to manufacturer's specifications and details.

10. Membrane overlaps shall be shingled with the flow of water.

E. Securement Around Perimeter and Rooftop Penetrations.

1. Around all perimeters, at base of walls, drains, curbs, vent pipes, or any other penetrations, bars shall be installed. Fasteners shall be installed according to the manufacturer's instructions. Fasteners should be installed using the fastener manufacturers recommended tools with depth locators.

2. Membrane flashings shall extend 4 inches past the bars and be hot-air welded to the membrane deck sheet.

3. A 4-mm PVC cord shall be welded on the penetration side of the bar to prevent tearing through of the membrane.

F. Adhesive Application: Only if required for roof flashing, use an adhesive (Sarnacol 2170 or approved equivalent) and prime the surface to receive the membrane. If the Contractor opts to use an adhesive on the cab roof, he shall notify the Resident Engineer. All vents and openings must be sealed with polyethylene sheeting and duct tape to prevent fumes from entering occupied areas of the Air Traffic Control Tower.

1. Apply adhesive (Sarnacol 2170 or approved equivalent) at a rate of 1-3/4 gallons per 100 square feet to the substrate surface.

2. Apply adhesive in a smooth even coating with no holidays, globs, and puddles. The adhesive shall be allowed to dry completely

prior to installing the membrane.

3. When the adhesive on the substrate is dry, the 0.080-inch PVC membrane is unrolled. Adjacent sheets shall be overlapped a minimum 6 inches.

4. Once in place, half of the sheet's length shall be coated with adhesive (Sarnacol 2170 or approved equivalent) at a rate of 1/2 gallon per 100 square feet. When the adhesive has dried sufficiently to produce strings, when touched with a dry finger, the coated membrane shall be carefully rolled onto the previously coated substrate to avoid wrinkles. Do not allow adhesive on the underside of the PVC roof membrane to dry completely. The amount of membrane that may be coated with adhesive before rolling onto the substrate will be determined by ambient temperature, humidity, and manpower.

5. The bonded sheet shall be pressed firmly into place with a weighted foam-covered lawn roller. The remaining unbounded half of the sheet shall be folded back and the bonding procedure repeated.

   Drying time increases with cooler temperatures. Also, the Contractor is cautioned against work on days of high humidity because of the extremely slow evaporation of the solvent. Contractor shall check with the roofing system manufacturer's representative on days of high humidity.

G. The membrane shall be smooth and free from wrinkles, air bubbles, puckers, and similar irregularities that leaves an unsightly appearance. Laid membrane not acceptable to the Resident Engineer shall be replaced or repaired in a manner that is acceptable to him/her.

H. The Contractor shall install the reinforced PVC membrane with strips as long as possible in order to minimize the number of end laps and short pieces that leave the appearance of a patchwork quilt.

I. No bonding adhesive shall be applied in the 4-inch lap area to be hot air welded. All sheets shall be applied

in the same manner, lapping all sheets as required by welding techniques.

7B.7 Hot-Air Welding of Lap Areas: Prior to hot-air welding operations, the Contractor shall notify the Resident Engineer. All vents and openings must be sealed with polyethylene sheeting to prevent fumes from entering occupied areas of the Air Traffic Control Tower.

A. General:

1. Adjacent sheets shall be welded in accordance with the manufacturers written instructions. All side and end laps shall be hot-air welded. Lap area shall be a minimum of 3 inches wide when machine welding, and a minimum of 4 inches wide when hand welding.

2. Equipment shall be provided by or approved by the manufacturer. All mechanics intending to use the equipment shall be adequately trained prior to welding.

3. All surfaces to be welded shall be clean and dry according to manufacturer recommendations. No adhesive shall be present within the lap areas.

B. Hand Welding: Hand welded seams shall be completed in three stages. Equipment shall be allowed to warm up for at least one minute prior to the start of welding.

1. The lap shall be tack welded every 3 feet to hold the seam in place. When hand welding laps of mechanically attached field and perimeter sheets, tack welding is not acceptable. Use weights or metal tracks to hold the seam in place for welding.

2. The back edge of the lap shall be welded with a thin, continuous weld to prevent loss of hot air during the final welding.

3. The hot-air nozzle shall be inserted into the lap, keeping the welding equipment at a 45 degree angle to the side lap. Once the proper welding temperature has been reached

and the material starts to flow, the hand roller shall be applied at a right angle to the welding gun and pressed lightly. For straight laps, the 1 ½-inch wide nozzle shall be used. For corners and compound connections, the ¾-inch wide nozzle shall be used.

C. Machine Welding: Machine welded seams may be achieved by the use of various automatic welding equipment. When using this equipment, the manufacturer's instructions shall be followed and local codes for electric supply, grounding and overcurrent protection observed. The automatic welding machines require 218 to 230 volts at 30 to 40 amps. The use of a portable generator is recommended.

D. Quality Control of Welded Seams: All completed welded seams shall be checked after cooling for continuity using a rounded screwdriver or other suitable blunt object. Visible evidence that welding is proceeding acceptably is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of black material from the edges of completed joints. As directed by the Resident Engineer, the Contractor shall make daily on-site evaluations of the welded seams. Two-inch wide cross-section samples shall be taken through completed seams. Correct welds will display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Contractor at no additional charge to the FAA.

7B.8 Walkway Tread Installation: The Contractor shall install walkway tread made from PVC membrane, .096 inches thick, reinforced with polyester-reinforced mat or approved equal. Walkways are to be installed as shown in the base building drawing and over the entire cab roof.

A. Walkway Tread Installation:

1. Roofing membrane to receive walkway tread shall be clean and dry.

2. Snap chalk lines on deck sheet to indicate location of walkway treads.

3. Walkway tread shall be unrolled and

positioned within chalk lines and fully adhered the field of the walkway treads except the 4in outside edge perimeter.

4. Hot-air weld the 4 in perimeter of the walkway tread to the deck sheet. Check all welds with a rounded screwdriver. Re-weld any inconsistencies.

7B.9 Base building cap shall be pvc metal: All cap shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Resident Engineer and the roofing membrane manufacturer. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the new roofing due to incomplete flashings, the affected area shall be removed and replaced at the Contractor's expense.

A. PVC metal cap shall be formed and installed per the detail drawings.

B. All metal flashings shall be fastened according to Sarnafil details to withstand 120 mph winds.

C. Adjacent caps of PVC metal shall be spaced 1/4 inch apart. The ends of the Sarnaclad metal shall be fastened 6 inches on center. The joint shall be covered with a 2-inch wide aluminum tape. A 4-inch wide strip of Sarnafil G410 flashing membrane shall be hot-air welded over the joint.

7B.10 Metal Flashings:

A. Metal details, fabrication practices, and installation methods shall conform to the applicable requirements of the following:

1. Factory Mutual Loss Prevention Data Sheet 1-49 (latest issue).
2. Sheet Metal and Air Conditioning Contractors National Association Inc. (SMACNA -- latest issue).

B. Metal, other than that provided by Roofing Manufacturer , is not covered under the Manufacturer warranty.

C. Complete all metal work in conjunction with roofing and flashings so that a watertight condition exists daily.

D. Metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion and contraction.

E. Metal joints shall be watertight.

F. Metal flashings shall be securely fastened into solid wood blocking. Fasteners shall penetrate the wood nailer a minimum of 1 1/4 inches.

G. Airtight and continuous metal hook strips are required behind metal fascias. Hook strips are to be fastened 12 inches on center into the wood nailer or masonry wall.

H. Counterflashing shall overlap base flashings at least 4 inches.

7B.11 Membrane Flashings:

All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Resident Engineer. Approval shall only be for specific locations on specific dates. Flashings shall be fully adhered to compatible, dry, smooth and solvent-resistant surfaces.

A. Over the properly installed and prepared substrate surface, contact adhesive shall be applied using approved solvent-resistant paint rollers. The adhesive shall be applied at a rate of approximately 1 1/2 to 2 1/2 gallons per 100 square feet of surface depending upon substrate. The adhesive shall be applied in smooth, even coatings with no holidays, globs, puddles or similar irregularities. Only an area which can be completely covered in that day's operations shall be coated with adhesive. The surface with adhesive coating shall be allowed to dry completely prior to installing the membrane.

B. When the surface is dry, the flashing membrane is cut to a workable length and the underside shall be evenly coated with adhesive at a rate of 1/2 gallon per 100 sq. ft. When the adhesive has dried sufficiently to produce strings when touched with a dry finger, the coated membrane shall be rolled onto the previously coated substrate being careful to avoid wrinkles.

C. No bonding adhesives shall be applied in lap areas that are to be welded to flashings or adjacent sheets. All sheets shall be applied in the same manner, lapping all sheets as required by welding techniques.

D. All flashing membranes shall be fully adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place, No bituminous elements shall be in contact with the membrane.

E. All flashings shall be hot-air welded at their joints and at their connections with the roof membrane.

F. All flashing membranes shall be mechanically fastened along the top edge through tin discs spaced a maximum of 1 foot on center, or predrilled metal strips. Expansion pins with nylon sheaths set in predrilled holes shall be used to secure flashings to masonry and concrete surfaces.

7B.12 Temporary Cut-Off:

A. All flashing shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses. When a break in the day's work occurs in the central area of a roof, a temporary waterstop shall be constructed to provide a 100% watertight seal. When work on the new system is suspended, the stagger of the insulation joints shall be maintained by installing partial fillers. The new membrane shall be carried into the waterstop. The waterstop shall be sealed to the substrate so that water will not be allowed to travel under the new or existing roofing. The edge of the membrane shall be sealed in a continuous heavy application of roof cement 6 inches wide, or use 1 inch wide night sealant as a substitution for the asphalt cement. Upon resumption of work, the contaminated PVC membrane shall be cut out. All contaminated areas, membrane, insulation fillers, etc., shall be removed from the work area and disposed of.

B. If inclement weather occurs while a temporary waterstop is in place, the Contractor shall provide the labor necessary to monitor the situation to maintain a watertight condition.

C. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at Contractor's expense.

7B.13 Field Quality Control: All welds shall be tested for continuity by running a rounding edge screwdriver along the membrane joints after cooling. Any discontinuities shall be re-welded. Positive evidence of good welding is characterized by an uninterrupted extrusion of melted black material from the joint. The Contractor is responsible to have the manufacturers inspector inspect the roof before the installation of the walkway tread membrane takes place.

7B.14 CONTRACTOR'S WARRANTY: The Contractor shall supply the FAA with a minimum 1-year workmanship warranty. In the event any work related to roofing, flashing, or metal work is found to be defective or otherwise not in accordance with the contract documents within two years of completion, the Contractor shall remove and replace at no cost to the FAA.

7B.15 MANUFACTURER'S WARRANTY: The single-ply roofing membrane material shall be guaranteed against defects by the manufacturer and be leaking free for a period of 20 years after completion. This warranty shall identify the FAA as owner of the facility. The location and effective starting date of warranty shall be indicated. The warranty shall be without any financial limitation in case of roof replacement.

The Contractor shall not be responsible for damage to the roof from extreme weather conditions such as tornadoes, lightning strikes, large hail, or damage caused by maintenance people working on the roof surface.

In the event water penetrates the roof system for reasons of either workmanship or material, the Contracting Officer will notify the Contractor in writing, within the 1-year workmanship warranty period, after the discovery of the failure, defect, or damage. If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the FAA shall have the right to replace, repair, or remedy the failure at the Contractor's expense.

After the 1-year workmanship warranty period, the Contracting Officer will contact the manufacturer directly.

All labor, materials, and travel expenses incurred to make the necessary repairs under the warranty period shall be at no cost to the FAA.

SECTION 7C

SECTION 07180 LIQUID APPLIED PEDESTRIAN TRAFFIC WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Evaluation/Preparation of Substrate to Receive Pedestrian Traffic Waterproofing

B. Pedestrian Traffic Waterproofing/Flashing Application

1.02 RELATED SECTIONS

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS See the general submittals requirement in division 1.

1.05 SCOPE OF WORK. Remove the existing elastomeric surface product for the catwalk area, all the way to concrete surface, cut and remove the 2" thin rusted metal flashing at the base of the metal panel, level, repair, prime and coat urethane epoxy reinforced walkway surface. Terapro by Siplast.

1.06 PRODUCT DELIVERY STORAGE AND HANDLING

A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.

B. Storage: Store closed containers in a cool, dry, well ventilated area away from heat, direct sunlight, oxidizing agents, strong acids, and strong alkalis. Keep products away from open fire, flame or any ignition source. Store temperature sensitive products at temperatures recommended by the manufacturer. Quartz silica (sand) must be kept dry during storage and handling.

C. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above will be rejected, removed and replaced at the Contractor's expense.

D. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Keep away from open fire, flame, or any ignition source. Vapors may form explosive mixtures with air. Avoid skin and eye contact with this material. Avoid breathing

fumes. Do not eat, drink, or smoke in the application area. Workers shall wear long sleeve shirts, long pants and work boots. Workers shall wear butyl rubber or nitrile gloves when mixing or applying this product. Safety glasses with side shields shall be used for eye protection. Use local exhaust ventilation to maintain worker exposure below TLV as listed on MSDS for respective products. If the airborne concentration poses a health hazard, becomes irritating or exceeds recommended limits, use a NIOSH approved respirator in accordance with OSHA Respirator Protection requirements under 29 CFR 1910.134. The specific type of respirator will depend on the airborne concentration. A filtering face piece or dust mask is not acceptable for use with this product if TLV filtering levels have been exceeded.

1.07 PROJECT/SITE CONDITIONS

A. Requirements Prior to Job Start

1. Notification: Give a minimum of 5 days notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.

2. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.

3. Safety: Familiarize every member of the application crew with safety regulations recommended by OSHA and other industry or local governmental groups.

B. Environmental Requirements

1. Precipitation: Do not apply materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that materials, applied membrane, and building interiors are protected from possible moisture damage or contamination.

2. Temperature Restrictions - PMMA-based Materials: Do not apply catalyzed resin materials if there is a threat of inclement weather. Follow the resin manufacturer's specifications for minimum and maximum ambient, material and substrate temperatures. Do not apply catalyzed resin materials unless ambient and substrate surface temperatures fall within the resin manufacturer's published range.

C. Protection Requirements

1. Protection: Provide protection against staining and mechanical damage for newly applied waterproofing and adjacent surfaces throughout this project.

2. Limited Access: Prevent access by the public to materials, tools, and equipment during the course of the project.

3. Debris Removal: Remove all debris daily from the project site and take to a legal dumping area authorized to receive such materials.

4. Site Condition: Complete, to the Owner's satisfaction, all job site clean-up including building interior, exterior, and landscaping where affected by the construction.
5. The access door needs to be seal from the inside and outside to control any fumes or dust to the interior of the cab area.

1.08 GUARANTEE

A. Guarantee - Reinforced Systems: Upon successful completion of the project, and after all post installation procedures have been completed, furnish the Owner with the manufacturer's 10 year guarantee covering labor and materials.

> Terapro 10-year Terapro Waterproofing Guarantee

PART 2 PRODUCTS

2.01 DESCRIPTION OF SYSTEMS

A. Liquid-Applied Pedestrian Traffic Waterproofing System: A [reinforced][unreinforced] fluid-applied, polymethylmethacrylate (PMMA) resin-based waterproofing system having a [colored acrylic chip/clear finish][a natural quartz/color finish] surfacing as selected from the manufacturer’s standard palette of colors.

Siplast Terapro [Reinforced][Unreinforced] Pedestrian Traffic Waterproofing System

2.02 MATERIALS

A. Membrane/Flashing Waterproofing Materials

1. Primer: A PMMA-based primer for use in vertical applications over concrete, concrete repair materials and masonry substrates.

Pro Primer W by Siplast; Irving, TX

2. Primer: A PMMA-based primer for over wood and plywood substrates.

   Pro Primer W by Siplast; Irving, TX

3. Primer: A PMMA-based primer for use over horizontal concrete substrates.

   Pro Primer T by Siplast; Irving, TX

4. Flashing Resin: A thixotropic, flexible, acrylic, PMMA-based resin for use in combination with a fleece fabric to form a monolithic, reinforced flashing membrane used in conjunction with a reinforced or unreinforced PMMA waterproofing system.

   Terapro Flashing Resin by Siplast; Irving, TX

5. Base Resin: A flexible, acrylic PMMA-based resin for use as waterproofing in a reinforced or unreinforced PMMA waterproofing system.

   Terapro Base Resin by Siplast; Irving, TX

6. Fleece: A non-woven, needle-punched polyester fabric used as a reinforcement in catalyzed resin flashing and field membrane systems.

   a) Nominal Thickness: 40 mils (1 mm)
   b) Weight: 110 grams per square meter Pro Fleece by Siplast; Irving, TX

7. Waterproofing/Wearing Layer Resin: A PMMA-based resin combined with aggregate filler to provide a waterproofing/wearing layer in a reinforced or unreinforced PMMA waterproofing system.

   Terapro VTS Resin by Siplast; Irving, TX

8. Aggregate Filler for Waterproofing/Wearing Layer Resin: A quartz aggregate blend/filler added to the waterproofing/wearing layer resin to produce a PMMA-based resin/aggregate slurry waterproofing/wearing layer.

   Terapro VTS Aggregate Filler by Siplast; Irving, TX

9. Color Finish: A pigmented, multi-component, PMMA-based finish layer for use in resin-based waterproofing and flashing systems.

   Pro Color Finish by Siplast; Irving, TX

10. Clear Finish: A clear PMMA-based finish layer for resin based waterproofing systems.

    Pro Clear Finish (satin) by Siplast; Irving, TX

2.03 WATERPROOFING ACCESSORIES

A. Cleaning Solution/Solvent: A clear solvent used to clean and prepare transition areas of in-place catalyzed resin to receive subsequent coats of resin and to clean substrate materials to receive resin.

   Pro Prep by Siplast; Irving, TX

B. Paste: A PMMA-based paste used for remediation of depressions in substrate surfaces prior to the application of the waterproofing system or used as a leveling layer at fleece overlaps of reinforced waterproofing systems.

   Pro Paste by Siplast; Irving, TX

C. Repair Mortar: A two-component, PMMA-based, aggregate filled mortar used for patching concrete substrates.

   Pro Repair Mortar by Siplast; Irving, TX

D. Catalyst: A peroxide-based reactive agent used to induce curing of acrylic resins.

   Pro Catalyst Powder by Siplast; Irving, TX

E. Natural Quartz: A natural-colored, kiln-dried, silica aggregate suitable for broadcast into the wearing layer of the waterproofing system and subsequently coated with a color finish. Quartz shall be supplied by the manufacturer of the waterproofing membrane.

   Pro Natural Quartz by Siplast; Irving, TX

F. Chip Surfacing: A blend of flat, angular, pigmented polymer flakes and silica suitable for broadcast into the color finish layer of the waterproofing system. The chip/silica blend shall be supplied by the manufacturer of the waterproofing membrane.

Pro Color Chips by Siplast; Irving, TX

G. Thixotropic Agent: A liquid additive used to increase the viscosity of the PMMA-based resin products, allowing the resins to be applied over vertical or sloped substrates.

Pro Thixo by Siplast; Irving, TX

PART 3 EXECUTION

3.01 SUBSTRATE EXAMINATION

A. General: Verify that the substrate is suitable to receive work. Notify the general contractor and/or specifier in writing of conditions detrimental to the proper and timely completion of work. Bring substrate deficiencies into an acceptable condition prior to commencing work.

B. Concrete Substrate Requirements: Structural concrete shall be cured a minimum of 28 days in accordance with ACI-308, have a minimum compressive strength of 3,500 psi (24 N/mm2) and have a moisture content that conforms with the waterproofing system manufacturer's requirements prior to commencement of work.

C. Moisture Content Evaluation: Evaluate the level of moisture in the substrate to determine that the moisture content is acceptable for application of the specified waterproofing system. Concrete substrates shall have a maximum moisture content of 6% by weight and a maximum internal relative humidity of 75%.

D. Adhesion Testing for Concrete Substrates to Receive Resin Materials: Test the concrete substrate using a device conforming to ASTM D 4541 using a 50 mm dolly adhered with the specified catalyzed primer. Utilize the same concrete preparation methods as that which will be used prior to application of the waterproofing for areas to be evaluated for adhesion. Ensure that a minimum adhesion value of 220 psi is obtained before application of the PMMA primer. If multiple areas or substrates are involved in the scope of work, evaluate each to determine suitability. Maintain testing/evaluation records.

3.02 SURFACE PREPARATION

A. Protection: Provide protection to prevent dust/debris accumulation, spillage and resin overruns.

B. Cleaning: Remove oil and grease with a commercial grade cleaner; thoroughly rinse and dry. Sweep, blow, or vacuum loose surface debris in areas to receive resin.

C. Taping: Utilize masking tape at perimeters and joints of the area to be waterproofed to provide neat terminations.

D. Masonry Walls: Shot-blast or grind concrete or masonry wall surfaces to provide a sound substrate free from laitance and all residue from bitumen, coal tar, primer, coatings, adhesives, sealer or any material that may inhibit adhesion. Following application of the specified primer but prior to application of the waterproofing system, fill cracks, voids, fractures, depressions, small indentations, and low areas in the substrate using the specified paste. The use of paste or sealant is not an acceptable alternative to repointing mortar joints. Do not apply waterproofing materials over soft or scaling brick or masonry, faulty mortar joints, or walls with broken, damaged or leaking coping components.

E. Preparation of Existing Concrete/Masonry Substrates to Receive Resin Materials: Existing concrete substrates shall have a minimum compressive strength of 3,500 psi (24 N/mm2). Following evaluation for moisture content and confirmation that the moisture content is at an acceptable level, shot blast or scarify/shot-blast concrete or masonry surfaces to provide a sound substrate free from laitance and residue from bitumen, coal tar, primer, coatings, adhesives, sealer or any material that may inhibit adhesion of the specified primer. Generate a concrete surface profile of CSP-2 to CSP-4 as defined by the ICRI. Grinding may be used as a preparation method for localized areas that cannot be reached by a shot blasting equipment provided that a surface can be prepared to a CSP-2 to CSP 4. Repair spalls and voids on vertical or horizontal surfaces using the specified primer and preparation paste.

F. Repair and Leveling of Concrete Substrate to Receive Resin Materials: Before application of the waterproofing membrane, and after priming, fill all joints, cracks, voids, fractures, depressions, small indentations, and low areas in the substrate using the specified paste and repair mortar.

H. Concrete Substrate Repair: Prime areas of the concrete substrate intended for repair using the specified PMMA

primer. Fill the areas using the specified paste or repair mortar and allow to catalyze. Follow the paste or repair mortar manufacturer's published minimum and maximum product thickness limitations per lift.

J. Rigid Plastic Flashing Substrates: Evaluate the plastic for compatibility with the resin materials. Clean plastic substrates using the specified the cleaner/solvent and allow to dry. Lightly abrade the surface to receive the flashing system. Extend the preparation area a minimum of 1/2 inch (13 mm) beyond the termination of the flashing system.

K. Static Crack and Static Cold/Control Joint Preparation - reinforced systems: Remove foreign materials from cracks and chase using appropriate equipment to bring the exposed concrete surfaces into a condition suitable to receive the primer. Clean cracks/joints and treat with the specified PMMA primer. Fill the cracks and joints using the specified preparation paste and allow to catalyze.

L. Static Crack and Static Cold/Control Joint Preparation - unreinforced systems: Remove foreign materials from cracks and chase using appropriate equipment to bring the exposed concrete surfaces into a condition suitable to receive the primer. Apply the specified primer to vertical walls of prepared cracks using a brush or other method to avoid over application. Allow the primer to catalyze. Fill cracks using the specified preparation paste and allow to catalyze. Wipe the previously applied primer and paste using the specified cleaning solution in areas having a 6 inch width centered over the crack. Apply a base coat of catalyzed flashing resin to the prepared substrate with a roller at the minimum rate specified by the resin manufacturer. Extend the catalyzed flashing resin 1/4 inch beyond where the fleece reinforcement will be placed. Embed 6 inch wide strips of the specified fleece reinforcement into the wet, catalyzed flashing resin base coat using a roller or brush to remove trapped air. Apply an additional coat of catalyzed flashing resin between layers of overlapping fleece. Fleece overlaps shall be a minimum 2 inches (50 mm). Apply a finish coat of catalyzed flashing resin immediately following the embedment of the fleece with a roller or brush at the minimum rate specified by the resin manufacturer, ensuring full saturation of the fleece reinforcement. Feather the reinforcement strips using paste to minimize telegraphing through the finished waterproofing system.

3.03 LIQUID-APPLIED WATERPROOFING INSTALLATION

A. Mixing and Catalyzing of Resins: Thoroughly mix the entire drum of uncatalyzed resins for 2 minutes if pouring the resin into a second container when batch mixing. Catalyze only the amount of material that can be used within its pot life. Add pre-measured catalyst powder to the resin component and stir for 2-minutes using a slow-speed mechanical agitator or mixing stir stick. The amount of catalyst added is based on the weight of the resin used. Refer to the waterproofing system manufacturer's literature for mixing ratios.

B. Mixing and Catalyzing of Waterproofing Resin/Aggregate Filler Blends: Thoroughly mix the entire drum of uncatalyzed resin and slowly add amount of filler specified by the waterproofing system manufacturer. Once the filler has been mixed into the resin component, add pre-measured catalyst powder to the resin/filler mixture and stir for 2-minutes using a slow-speed mechanical agitator. The amount of catalyst added is based on the weight of the resin used. Refer to the waterproofing system manufacturer's literature for mixing ratios.

C. Priming: Using the appropriate primer, apply to masonry, concrete and plywood surfaces that will receive the waterproofing membrane or flashing. Apply the primer using a roller at the minimum rate specified by the primer manufacturer and allow to cure for a minimum of 45 minutes. Increase application rates over other absorbent substrates. Do not let resin pool or pond. Do not over-apply primers as this may interfere with proper primer catalyzation. When calculating application rates, make allowances for saturation of roller covers and application equipment.

D. Flashing Membrane Application: Complete flashing application prior to the waterproofing membrane application in the field of the roof area. Using masking tape, mask the perimeter of the area to receive the flashing system. Pre-cut fleece to ensure a proper fit at transitions and corners prior to flashing membrane application. Apply a base coat of catalyzed flashing resin to the substrate with a roller or brush at the minimum rate specified by the resin manufacturer. Extend the catalyzed flashing resin 1/8 inch (3 mm) beyond where the fleece reinforcement will be placed. Embed the specified fleece reinforcement into the wet,

catalyzed flashing resin base coat using a wet, but not saturated, roller or brush to remove trapped air. Overlap the fleece a minimum of 2 inches (51 mm). Apply an additional coat of catalyzed flashing resin between layers of overlapping fleece. Apply a finish coat of catalyzed flashing resin immediately following the embedment of the fleece with a roller or brush at the minimum rate specified by the resin manufacturer, ensuring full saturation of the fleece reinforcement. Remove the tape before the catalyzed resin sets. Make allowances for saturation of roller covers and application equipment when calculating resin quantities. Allow to cure for a minimum of 45 minutes.

NOTE: Select applicable waterproofing system(s) and surfacing(s) from the options below, and delete items not required.

E. Application of Reinforced, Quartz-Surfaced Waterproofing System over Prepared Substrates:

1. Using cleaner/solvent, wipe flashing membrane and primer surfaces to receive the field membrane. Allow the surface to dry for a minimum 20 minutes before continuing work.

2. Using a roller, apply a layer of catalyzed base resin over the primed substrate at the minimum rate specified by the resin manufacturer. Embed the fleece reinforcement into the wet, catalyzed base resin waterproofing layer using a wet, but not saturated, roller to remove trapped air. Overlap side and end laps of the fleece a minimum of 2 inches (51 mm). Apply an additional coat of catalyzed base resin between layers of overlapping fleece. Apply a second coat of catalyzed resin immediately following the embedment of the fleece with an application roller or brush at the minimum rate specified by the resin manufacturer, ensuring full saturation of the fleece reinforcement. Allow to cure for a minimum of 45 minutes before application of the wearing layer of resin.

3. Apply a layer of catalyzed waterproofing resin/aggregate filler mixture using a trowel at the minimum rate specified by the waterproofing system manufacturer. Use a spiked roller to remove trowel marks and to even the application of the waterproofing resin/aggregate filler mixture.

4. Immediately broadcast natural quartz into the wet waterproofing layer/aggregate filler mixture to refusal. Allow to cure for 2 hours. Sweep excess quartz from the surface.

5. Apply color finish using a roller or squeegee at the rate specified by the resin manufacturer.

6. Make allowances for saturation of roller covers and application equipment when calculating resin application rates.

7. If work is interrupted for more than 12 hours, or the surface of a catalyzed resin layer becomes dirty or contaminated from exposure to the elements, thoroughly clean the area with cleaner/solvent. Allow a minimum of 20 minutes for the solvent to evaporate before continuing work. Complete the next application procedure within 60 minutes following the evaporation of the cleaner/solvent.

F. Application of Reinforced Chip-Surfaced Waterproofing System over Prepared Substrates:

1. Using cleaner/solvent, wipe flashing membrane and primer surfaces to receive the field membrane. Allow the surface to dry for a minimum 20 minutes before continuing work.

2. Using a roller, apply a layer of catalyzed base resin over the primed substrate at the minimum rate specified by the resin manufacturer. Embed the fleece reinforcement into the wet, catalyzed base resin waterproofing layer using a wet, but not saturated, roller to remove trapped air. Overlap side and end laps of the fleece a minimum of 2 inches (51 mm). Apply an additional coat of catalyzed base resin between layers of overlapping fleece. Apply a second coat of catalyzed resin immediately following the embedment of the fleece with an application roller or brush at the minimum rate specified by the resin manufacturer, ensuring full saturation of the fleece reinforcement. Allow to cure for a minimum of 45 minutes before application of the wearing layer of resin.

3. Apply a layer of catalyzed waterproofing resin/aggregate filler mixture using a trowel at the minimum rate specified by the waterproofing system manufacturer. Use a spiked roller to remove

trowel marks and to even the application of the waterproofing resin/aggregate filler mixture. Following cure, smooth the surface of the catalyzed waterproofing resin/aggregate filler mixture using the sharp edge of a trowel, sandpaper or a fine-surfaced wheel.

5. Inspect the surface of the cured resin/aggregate filler mixture to identify low or uneven areas. Clean identified areas with cleaner/solvent and allow a minimum of 20 minutes for the solvent to evaporate. Apply paste to level or smooth low or uneven areas. Allow the paste to cure for a minimum of 60 minutes before installation of the color finish layer.

6. Apply a layer of color finish using a prepared roller over the catalyzed resin/aggregate filler mixture at the minimum rate specified by the waterproofing system manufacturer.

7. Immediately broadcast the chip/silica blend into the wet color finish using a hopper gun at the minimum rate specified by the waterproofing system manufacturer. Allow to cure for a minimum 2 hours and remove loose chips using a blower or vacuum. Sweep excess chips from the surface. Allow to cure for an additional hour following removal of excess chips.

8. Apply clear finish using a prepared roller over the embedded chip/silica surface at the rate specified by the waterproofing system manufacturer.

9. If work is interrupted for more than 12 hours, or the surface of a catalyzed resin layer becomes dirty or contaminated from exposure to the elements, thoroughly clean the area with cleaner/solvent. Allow a minimum of 20 minutes for the solvent to evaporate before continuing work. Complete the next application procedure within 60 minutes following the evaporation of the cleaner/solvent.

G. Application of Unreinforced Quartz-Surfaced Waterproofing System over Prepared Substrates:

1. Using cleaner/solvent, wipe flashing membrane and primer surfaces to receive the field membrane. Allow the surface to dry for a minimum 20 minutes before continuing work.

2. Apply a layer of catalyzed waterproofing resin/aggregate filler mixture using a trowel at the minimum rate specified by the waterproofing system manufacturer. Use a spiked roller to remove trowel marks and to even the application of the waterproofing resin/aggregate filler mixture.

3. Immediately broadcast natural quartz into the wet waterproofing layer/aggregate filler mixture to refusal. Allow to cure for 2 hours. Sweep excess quartz from the surface.

4. Apply color finish using a roller or squeegee at the rate specified by the resin manufacturer.

5. Make allowances for saturation of roller covers and application equipment when calculating resin application rates.

H. Application of Unreinforced Chip-Surfaced Waterproofing System over Prepared Surfaces:

1. Using cleaner/solvent, wipe flashing membrane and primer surfaces to receive the field membrane. Allow the surface to dry for a minimum 20 minutes before continuing work.

2. Apply a layer of catalyzed waterproofing resin/aggregate filler mixture using a trowel at the minimum rate specified by the waterproofing system manufacturer. Use a spiked roller to remove trowel marks and to even the application of the waterproofing resin/aggregate filler mixture. Following cure, smooth the surface of the catalyzed waterproofing resin/aggregate filler mixture using the sharp edge of a trowel, sandpaper or a fine-surfaced wheel.

3. Inspect the surface of the cured resin/aggregate filler mixture to identify low or uneven areas. Clean identified areas with cleaner/solvent and allow a minimum of 20 minutes for the solvent to evaporate. Apply paste to level or smooth low or uneven areas. Allow the paste to cure for a minimum of 60 minutes before installation of the color finish layer.

4. Apply a layer of color finish using a prepared roller over the catalyzed resin/aggregate filler

mixture at the minimum rate specified by the waterproofing system manufacturer.

5. Immediately broadcast the chip/silica blend into the wet color finish using a hopper gun at the minimum rate specified by the waterproofing system manufacturer. Allow to cure for a minimum 2 hours and remove loose chips using a blower or vacuum. Sweep excess chips from the surface. Allow to cure for an additional hour following removal of excess chips.

6. Apply clear finish using a prepared roller over the embedded chip/silica surface at the rate specified by the waterproofing system manufacturer.

7. If work is interrupted for more than 12 hours, or the surface of a catalyzed resin layer becomes dirty or contaminated from exposure to the elements, thoroughly clean the area with cleaner/solvent. Allow a minimum of 20 minutes for the solvent to evaporate before continuing work. Complete the next application procedure within 60 minutes following the evaporation of the cleaner/solvent.

I. Application of Color Finish over Flashings:

1. Mask the previously applied horizontal surfaces and install a layer of the specified color finish with a prepared roller over the flashing system on vertical surfaces at the minimum rate specified by the waterproofing system manufacturer.

3.04 FIELD QUALITY CONTROL AND INSPECTIONS

A. Site Condition. All areas around job site shall be free of debris, waterproofing materials, equipment, and related items after completion of job.

B. Notification Of Completion: Contractor shall notify manufacturer by means of manufacturer's printed Notification of Completion form of job completion in order to schedule a final inspection date.

C. Final Inspection: Hold a meeting at the completion of the membrane application attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative.

Complete, sign, and mail the punch list form to the manufacturer's headquarters.

D. Issuance Of The Guarantee. Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

SECTION 7D
CAULKING

7C.1 Scope of Work: The extent of work is indicated on the drawings and by the requirements of this section.

7C.2 Materials: The caulking shall be chemically compatible with the PVC flashing membrane and must match the membrane in color:

A. Surrounding Area. Caulking shall be compatible with the PVC flashing and roofing membrane.
Materials shall be delivered to the job in sealed containers with manufacturer's original label attached. All materials shall be prime and used according to the manufacturer's printed instructions. Materials shall not exceed the manufacturers stated shelf life. Acceptable products are:

1. Sonneborn NP-1 by Chemrex, Inc.
2. Silpruf by General Electric Co.
3. Vulkem 116 by Mameco International
4. Vulkem 921 by Mameco International
5. Pecora 60+ by Pecora Corporation
6. PTI-404 by Protective Treatments, Inc.
7. ACRYL-R S-M5522 by Schnee Morehead
8. SM-205 by TACC International
9. Tremseal-S by Tremco
10. Mono by Tremco
11. Multipurpose Sealant by Sarnafil, Inc.

7C.3 Application: Caulking shall be applied at the consistency in the temperature range, and in the manner recommended by the manufacturer. In all cases, the amount of exposed caulking shall be kept at a minimum and tooled to present a professional finished appearance.

09260 DRYWALL CONSTRUCTION

PART 1.00 GENERAL

1.01 WORK INCLUDED:

Furnish labor, materials, equipment and incidentals necessary to repair, replace, install drywall, including furring and all taping, bedding, sanding and finishing of gypsum board surfaces in the designated areas.

Work Requirements:

The following activities are related to repairing the interior of the Sanford ATCT.

Base Building:

Columns:

Remove existing drywall and materials down to solid substrate.

Apply a corrosion inhibitor to the areas that are displaying rust.

Install new 5/8” gypsum board around the column.

Paint to match existing area.

Ceiling:

Grind surface of metal plate down to non-corroded metal.

Apply a corrosion inhibitor to the visible surface of the metal plate.

Install new 24” square lay-in ceiling tiles to match existing.

Replace all damaged and stained ceiling tiles throughout facility. Approximately 36, leave two unopened boxes as spares.

Tower Shaft

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Floor levels:

Replace 5/8” GWB drywall at each of the intermediate levels in the tower shift around each of the windows.

Paint surfaces to match existing.

Install wallpaper in areas where applicable.

Warped ¾” plywood stool at window sill, above AC unit will need to be replaced with similar at each level.

Apply a poly-urethane coating over surface.

Stairwell:

Replace/Repair drywall at tower stairwell Exit.

Remove damaged drywall.

Replace with 5/8” GWB.

Sand and paint surface.

1.02 RELATED WORK COVERED ELSEWHERE:

Painting Section 09901

1.07 JOB CONDITIONS:

A. Maintain temperatures inside work spaces at 55 degrees to 80 degrees F. during drywall installation. Take precautions to limit sustained high humidity conditions. Provide adequate ventilation.

B. Minimum requirements for drywall framing systems shall be ANSI A97.1 "Standard Specification for the Application and Finishing of Gypsum Board," unless more restrictive conditions are specified herein.

PART 2.00 PRODUCTS

2.01 MATERIALS:

A. GYPSUM WALLBOARD:

Fabricated wallboard with a non combustible gypsum core encased in heavy paper; lengths corresponding to usage, as follows:

1. Normal: Tapered edge, square cut wall board conforming to ASTM-C-36; 48 inches wide by 5/8 inch thick.

B. METAL ACCESSORIES:

1. Corner Beads: U.S.G. No. 100 or 101 "Dur A Bead"; 26 gauges galvanized steel 1 1/2" wide with perforated wing.

2. Metal Trim: U.S.G. No. 200 series; galvanized steel with 7/8" inch flange.

F. FASTENERS:

Self drilling, self tapping steel screws, corrosive resistant with Phillips headed recesses, conforming to ASTM 646; and Type S bugle head drywall screws conforming to ASTM C1002.

G. JOINT COMPOUND:

Ready-mixed compound complying with ASTM C-475, U.S.G. "Ready Mixed" joint compound.

H. TOPPING COMPOUND:

Special formulation mixture, as manufactured by USG, Georgia Pacific, Gold Bond, or approved equal.

I. REINFORCING TAPE:

Cross fiber paper tape, 2" inches wide; U.S.G. "Perf A Tape" or approved equal.

K. SEALANTS:

1. Water resistant sealant as recommended by gypsum board manufacturer.

PART 3.00 EXECUTION

3.01 PREPARATION:

A. Prior to beginning work, spaces shall be cleared of trash, debris, tools, and other material.

B. Procedures and methods not otherwise specified shall be in accordance with the manufacturer's printed instructions.

3.02 METAL PARTITION SYSTEM:

A. Replace any damage metal stud.

B. Position studs vertically, engaging both floor and top runners at 16" inch o.c. Anchor studs adjacent to doors, window frames, partition intersections and corners to runner flanges with 3/8" inch Type S, pan headed screws through each flange. Locate studs no more than 2" inches from door frame, intersections, and corners.

3.03-3.06 NOT IN USE:

3.07 FASTENER APPLICATION:

Screws used for fastener application shall conforming to the following:

Wallboard

Application	Thickness	Screw Type
Single layer to studs	5/8"	1" Type S bugle head
Double layer to studs	5/8"	1 5/8" Type S bugle head
Studs to runner's	3/8"	Type S12 pan head
Steel studs to door frame	1/2"	Type S12 clips low profile
Studs and tracks to concrete	Expansion bolts with shields or power activated fasteners	

3.08 WALLBOARD INSTALLATION:

A. Drive fasteners so that heads provide a slight depression below the surface of the panel without breaking the face paper. Install fasteners no closer than 3/8" inch to edges. Remove canted or misaligned screws and replace with proper fasteners approximately 1 1/2" inch away.

B. Make cuts uniformly and neatly. Fit edges to close tolerances, without forcing. Cut openings for electrical outlets and around piping or other wall penetration. Do not install vertical joints within eight (8") inches of openings. Do not install "scrap" or small sections of wallboard in a "quilt work" fashion.

C. Regardless of the method used to repair wall panels, the joints on the far side of the partition shall be staggered from the joints on the near side.

D. Install metal accessories. Provide metal corner reinforcements at each outside corner. Install metal trim where wallboard edges are exposed, or not otherwise trimmed out. construction, and as otherwise indicated on the plans.

3.09 NOT IN USE:

3.10 GYPSUM SHEATHING:

A Install using No. 6 Type 5 or 5-12 bugle headed, self tapping, corrosion resistant screws shall be used for attaching to metal. Attach with

screws at 8" centers at perimeter and 8" centers at field of panel. Fasteners shall be driven to be flush will surface of sheathing. Fasteners shall not be nearer than 3/8" to edge of sheathing.

3.11 NOT IN USE:

3.12 NOT IN USE:

3.13 JOINT TREATMENT:

A. Mix joint compound according to the manufacturer's instructions. Fill nail holes and depressions with two (2) coats of a joint compound, as described for joint finish, resulting in a completely level surface without depressions. Apply joint compound in a thin layer to all joints and angles. Immediately install reinforcing tape centered over joint and seated into compound with a trowel, leaving 1/64" inch to 1/32" inch of compound under the tape. Immediately follow with a thin shim coat of compound to completely embed the tape. Fold the tape to fit into corners.

B. Allow the first coat to dry. Apply a second coat of joint compound over the first, filling tape flush with surface. Cover tape and feather out slightly beyond tape. Allow to dry thoroughly and sand lightly. Apply a finish coat evenly and extend out over the edge of the proceeding joint compound. Sand lightly.

C. Install corner beads and other accessories before the start of finishing. Apply compound level with the finish edge of the accessory, completely covering the ground with two (2) coats of compound, resulting in a completely level and true surface. Prevent distortions in the wall plane as a result of improperly installed accessories. Apply finish coat along with wall finish and sand lightly.

D.

3.14 FINISHING:

Seal textured wall surfaces with a sealer primer.

END OF SECTION

09509 ACOUSTICAL CEILINGS AND SUSPENSION SYSTEMS

PART 1.00 GENERAL

1.01 WORK INCLUDED:

Furnish labor, materials, equipment and incidentals necessary to replace all the ceiling panel at the base building entrance, hallway and any water damage ceiling panel on the atct towers (for bid purposes expect 20 tiles for the towers) , install new ones and replace damage suspension grid. Contractor shall visit the site to identified the ceiling panel.

1.02 NOT USE

1.03 QUALITY ASSURANCE:

A. FIRE RESISTANT REQUIREMENTS:

Acoustical materials shall have a class 25 flame spread rating conforming to Fed Spec SS-S-178A.

1.04 SUBMITTALS:

Submittals shall be in accordance with Section 01300, SUBMITTALS and shall include:

A. Product data sheets.

B. Samples of each type of acoustical tile.

1.05 NOT IN USE

1.06 DELIVERY,HANDLING AND STORAGE:

Materials shall be delivered to the site in the manufacturer's original unopened containers with brand name and labels attached. Material shall remain inside packages until installed. Store under cover inside building only when temperature and humidity can be controlled.

1.07 JOB CONDITIONS:

A. Provide one (3) unbroken carton of ceiling tile Store in a place designated by the Contracting Officer for future replacement purposes.

D. Install acoustical products only when temperature and humidity conditions are approximately that of the

building when occupied. Maintain a minimum 60 degrees F to 90 degrees F with a maximum relative humidity of 90 percent.

PART 2.00 PRODUCTS

2.01 MATERIALS:

A. SUSPENSION SYSTEMS:

1. Grid member use to repair the existing system should be the same or similar to existing.

B. ACOUSTICAL TILE:

1. TYPE A: (ATC-1Replace with the same dimension as existing thick, fine line edge, lay-in, acoustical panels with factory applied white vinyl latex paint finish; Class A with a flame spread of 0-25; STC range 40-44; "random fissured" design as manufactured by USG Interiors, Inc. or approved equal.

C. HANGERS:

9 Gauge annealed hanger wire, conforming to Fed Spec. QQ-W-461, Class 1.

D. STRAP HANGERS:

1" wide x 3/16" thick steel strap hanger conforming to Fed Spec QQ-S-775.

E. HANGER RODS:

Zinc coated threaded steel rods.

F. COLD ROLLED CHANNEL:

1 1/2" cold formed painted steel channels weighing not less than 300 #/1000 linear feet.

3.00 EXECUTION

3.01 PREPARATION:

Remove excess materials, tools, trash and debris from work areas. Sweep the area and maintain it free of debris to allow movement of a rolling scaffold.

3.02 INSTALLATION:

A. Reuse existing grid system except the damage and rusted. Furnish and reinstall exposed damage grid system in strict accordance with the manufacturer's recommendation. Place 9 gauge wire hangers, spaced at no more than four (4') foot centers along each main runner and no more than 6 inches from each end. Twist wire sufficiently to prevent slipping. Erect the suspension system to the proper height and level in both directions. Where necessary to cut a main runner to center a light fixture or a ceiling register, add hanger wires to both sides at the termination of the runner.

3.03 FIELD QUALITY CONTROL:

A. Ceilings shall be installed to a tolerance of 1/8" in 12'-0" in level and straightness variation shall not exceed 1/360 of span length.

3.04 CLEAN AND ADJUST:

A. Prior to final inspection, all the damage tiles in the identified areas need to be replace and damage grid replace.

END OF SECTION

09901 PAINTING

PART 1.00 GENERAL

1.01 WORK INCLUDED:

A. Furnish labor, materials, equipment, and incidentals necessary to paint the repairs walls in the tower and the base building entrance area.
B. The access catwalk door need to be clean from any rust, prime and paint

1.03 QUALITY ASSURANCE: [Not Used]

1.04 SUBMITTALS:

Submittals shall be in accordance with Section 01300, SUBMITTALS and shall include:

A. Schedule showing each paint surface correlated with the paint system to be used on each.

B. Product data sheets for each paint product.

C. Color charts for each paint type.

D. Certification of paint grade and quality.

E. Provide samples of each color and sheen, prepared on 12" x 12" white cardboard panels. Identify each color on back with brand, name of color and mixing formula.

1.06 DELIVERY, HANDLING AND STORAGE:

A. Deliver materials in the original containers with labels intact and seals unbroken. With the exception of ready mixed materials, perform all mixing at plant.

B. Storage space will be designated for painting materials and tools. Protect the entire floor surface from damage or spilled paint. Keep paint containers covered at all times. Provide adequate safeguards to prevent fires and maintain storage room in clean condition.

C. Upon leaving the storage area, clean spilled paint and remove empty containers and construction debris. Restore room to finish condition.

1.07 JOB CONDITIONS:

A. Contractor shall be responsible to coordinate factory prime coats and field painting. When shop applied primer is not compatible with the finish system specified herein, Contractor shall notify the COR and receive instructions to rectify the situation.

B. Exterior painting shall not be performed in rainy, damp or frosty weather, or until surface is thoroughly dry.

C. Areas to be painted shall be broom cleaned. Unnecessary materials, tools, debris and equipment shall be removed.

PART 2.00 PRODUCTS

2.01 MATERIALS:

A. GENERAL:

1. Manufacturers: The following manufacturers are acceptable sources for the types of material specified elsewhere in the contract documents:

A. Benjamin Moore & Co. (Benjamin Moore).
B. Coronado Paint Company (Coronado).
C. ICI Paint Stores, Inc. (Glidden, Devoe).
D. Kelly-Moore Paint Co. (Kelly-Moore).
E. M. A. Bruder & Sons, Inc. (M. A. B. Paint).
F. PPG Industries, Inc. (Pittsburgh Paints).
G. Sherwin-Williams Co. (Sherwin-Williams).
H. Tnemec Company, Inc..

Interior Paint Schedule

1. Ferrous Metal: Provide the following finishes systems over interior ferrous metal.

Approved low-VOC (low-odor) paint systems for a low-luster (eggshell or satin) acrylic finish over interior ferrous metal subject to normal use.

Low-Luster Finish: 2 finish coats over a rust-inhibitive primer: For interior applications listed above in Section A.

Primer: Rust-inhibitive metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.3 mils (0.033 mm).

- ICI: Glidden Ultra-Hide Interior/Exterior Gripper Primer
- Benjamin Moore: Moorcraft Super Spec Latex Enamel Undercoater & Primer/Sealer (253)
- PPG: MultiPrime Low VOC Quick Dry Universal Primers
- S-W: Harmony Interior Latex Primer (B11W900) manufactured by Sherwin Williams or approved equal.

First and Second Coat: Low-sheen (eggshell or satin), exterior, acrylic-latex paint applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.8 mils (0.071 mm).

- ICI: Glidden Lifemaster Interior Egg-Shell Latex 9300
- Benjamin Moore: Moorcraft Super Spec Acrylic Epoxy Coating (256)
- PPG: Pure Performance Interior Egg-Shell Latex
- S-W: Harmony Low Odor Interior Latex Eg-Shel, B9 Series, manufactured by Sherwin Williams or approved equal

2.02 COLORS AND TINTS:

A. The selected colors should match the existing walls.

C. SELECTION AND MIXING:

Selected colors are from the Sherwin Williams or Aqua fleck standard color system. If another manufacturer's paint is approved for use, these colors shall be matched exactly. Colors, regardless of quantity, shall be mixed by the manufacturer, using equipment and methods that provide scientifically accurate proportioning of pigments. No colors shall be mixed on the job.

2.03 NOT USE:

PART 3.00 EXECUTION

3.01 PREPARATION - GENERAL:

A. Properly prepare surfaces receiving finish, as scheduled or specified. Remove loose accumulations of dust or dirt with an air blower, or vacuum, or by sweeping with a brush. Where necessary, wash with detergent followed by rinsing with clean water.

B. Do not apply paint or transparent finishes under conditions of weather or temperature

unsuitable for executing a first-class job. When surfaces are unsuitable for the application of acceptable finishes notify Contracting Officer in sufficient time for conditions to be corrected. Start of work implies acceptance of these surfaces and later claims of defects in such work shall in no way change the requirements of this specification.

D. Remove rust and scale from metal surfaces with a wire brush, scraper and emery cloth down to the new metal and treat with rust inhibitor. Retouch shop paint where marred and paint field welds, bolts, etc., with same primer. Fill dens, depressions and flush head countersunk screws flush with body putty.

E. Wipe surfaces galvanized steel with cleaning solvent to remove oil and grease. Etch with solution of copper sulphate crystals or etching solution.

3.02 SPECIAL PREPARATION:

A. P 3 STEEL, SOLVENT CLEANING SSPC SP 1 63:

Remove oil, grease, dirt, soil or contaminants by cleaning with solvent or steam.

B. P 4 STEEL, HAND TOOL CLEANING SSPC SP 2 63:

Remove loose rust, loose mill scale and loose paint to firm surface by hand chipping, scraping, sanding or wire brushing.

C. P 5 STEEL POWER TOOL CLEANING SSPC SP 3:

Remove loose rust, loose mill scale and loose paint by power tool chipping, descaling, sanding, wire brushing and grinding.

D. P-10 DRYWALL:

Drywall surfaces shall be clean and dry. Joint treatment shall be thoroughly dry. Texture shall be applied and defects repaired. Cracks or voids shall be filled with spackle compound to match adjacent surfaces. Prime metal casing and corner heads before applying water-based paints. Prime walls as recommended by manufacturer which receive Crafton paint.

3.03 INSTALLATION:

A. BRUSH APPLICATION:

Use only top quality hog hair or synthetic bristle brushes. Apply paint to form a uniform film of a thickness which is consistent with the specified coverage. Use sufficient cross brushing to fill surface irregularities and complete coverage. Use care when painting corners and other restricted places so that a uniform application is obtained. Final brushing strokes shall be made in the same direction and toward the previously applied paint. Brush the final coats of enamel paints only enough to spread the coating evenly and avoid excessive thickness.

B. SPRAY APPLICATION:

When paint is applied by spray, the air gun used shall be adjustable to regulate the air and paint mixture. The equipment shall have a suitable water trap to remove moisture present in the compressed air. Paint pots shall be equipped with a hand agitator to keep the paint mixed well. The width of the spray shall be not less than twelve (12") inches, nor more than eighteen (18") inches. The pressure shall be suitable for type of paint used.

C. PAINTING OVER SHOP COAT:

Where an item to be painted has a shop coat of paint, primer may be omitted. Touch up marred surfaces of shop coat before applying finish coats.

3.04 WORKMANSHIP:

A. Painting shall be accomplished by skilled mechanics in a workmanlike manner. The Contractor shall be responsible for the quality of his work and shall not begin any work until the surfaces have been properly prepared.

B. Do not finish any surface which has hammer marks, cuts, splits, exposed nails, nail ridges or improper workmanship, loose joints or improper jointing that normal finishing procedures will not conceal. Inspect surfaces and report defects which should be corrected before painting to the Contractor.

C. Apply coats evenly and consistently. They shall be free from sags, runs, crawls, or other defects.

Brush coats so that only a minimum amount of brush marks show. Allow each coat to dry thoroughly before applying next coat. Lightly sand enamels and varnishes with No. 000 sandpaper between successive coats. Applying paints without thinning or adulterating.

D. Apply paint with a brush only, except that large areas may be applied by rollers. Wood finishes other than those scheduled to be painted, may be sprayed. Metal deck and structural system may be brushed or sprayed. No other spray painting shall be allowed unless specified or approved in writing, or so noted elsewhere.

3.05 FIELD QUALITY CONTROL:

Each coat shall be applied to the manufacturer's recommended spreading rate. If the coverage is not adequate, or when requested by the Contracting Officer, provide testing apparatus necessary to determine the paint film thickness. Provide wet film gages and test each layer while paint is wet. Provide additional coats of paint until the manufacturer's specified film thickness is achieved or the finish coat completely covers previous coats.

3.06 CLEAN AND ADJUST:

Thoroughly clean equipment at the end of each work day. Upon completion of this work, remove paint from the finished or prefinished surfaces such as transparent finish wood, ceiling grid, etc., and from unfinished surfaces such a tile, glass, aluminum, hardware, etc., and from unfinished surfaces such a tile, glass, aluminum, hardware, etc. Remove rubbish and accumulated materials connected with this work from the premises.

Alternate A

SECTION 15562
Replacement of Packaged Terminal Heat Pump Units
Airport Traffic Control Tower
Sanford, Florida

1.1 **Work Requirement.**
Remove one existing packaged terminal heat pump (PTHP) unit on floors 2 through 7. Install one new PTHP on floors 2 through 7 with electrical power cord and condensate drain kit. Connect to existing electric power receptacle and condensate drain pipe. Coordinate with drywall and interior work as required to avoid interference with other trades, avoid damage to existing building surfaces and finishes, and expedite installation of PTHP units. Dispose of old units in accordance with FAA and EPA requirements.

1.2 **Submittals**

A. Before equipment is ordered or material fabricated provide 6 copies of manufacturer's complete performance date and descriptive literature to the Contracting Officer for review and approval.

B Operations and Maintenance Manuals
Provide 3 copies of operating and maintenance instructions, service manuals, installation instructions, catalog data, parts list and wiring diagrams for each of item of equipment furnished.

1.3 **Electrical Service Verification**

Verify that existing electrical receptacles for PTHP units are designed for NEMA 6-30R service. Notify the Contracting Officer of any discrepancies prior to ordering equipment.

1.4 **Unit Operational Checkout**

Upon completion of the installation of the new equipment test data shall be obtained as indicated below. All tests shall be made with units operating at full load conditions, if reasonably possible. Use instruments that are accurately calibrated and maintained in good working condition. All testing and measurements shall be witnessed by the COR. Provide 3 copies of typewritten test report for review and approval prior to final acceptance. Include one copy of test report in each operation and maintenance manual specified elsewhere. The following test data is required for each new unit:

Manufacturer, Model Number, Serial Number, Refrigerant Type, Outdoor Air Temperature (dry bulb), Outdoor Air Temperature (wet bulb), Outdoor Relative Humidity, Entering Unit Indoor Air Temperature (dry bulb), Entering Unit Indoor Air Temperature (wet bulb), Entering Unit Indoor Relative Humidity, Leaving Unit Indoor Air Temperature (dry bulb), Leaving Unit Indoor Air Temperature (wet bulb), Leaving Unit Indoor Relative Humidity, CFM High Speed, CFM Medium Speed, CFM Low Speed. Perform tests with units in cooling mode, heat pump heating mode, and electrical resistance heater heating mode. Perform tests with fan on high speed.

1.5 Packaged Terminal Heat Pump

All units shall be factory assembled, piped, wired and fully charged with R-410A refrigerant. All units shall be certified in accordance with ARI Standard 310 for air conditioners and ARI Standard 380 for heat pumps. Units shall be UL listed and carry a UL label. All units shall be factory run-tested to check operation.
The basic unit shall not exceed 16 inches high x 42 inches wide. Overall depth of the unit from the rear of the wall sleeve to the front of the decorative front cover shall not exceed 21-1/4 inches. The unit shall be designed so that room intrusion may be as little as 7-1/2 inches. Installation in wall deeper than 13-1/4 inches may be accomplished with the use of a deep wall sleeve. Unit shall draw in ambient air though both sides of an outdoor architectural louver or grille and shall exhaust air out middle portion of the louver.

1.6 Refrigeration System

The refrigeration system shall be hermetically sealed and consist of a rotary compressor that is externally mounted on vibration isolators no small than 1-3/8 inches diameter x 1-1/2 inches high; condenser and evaporator coils constructed of copper tubes and aluminum plate fins; and capillaries as expansion devices. Unit shall have a fan slinger ring to increase efficiency and condensate disposal and have a drain pan capable of retaining 1.5 gallons of condensate. A tertiary condensate removal system shall also be incorporated for backup and shall overflow through the wall sleeve and to the outside of the building as a safeguard again damage to the interior room.

1.7 Indoor Air Handling Section

The indoor air handling section shall consist of a tangential blower wheel direct driven by a totally enclosed motor. The air handling system shall be designed to minimize airflow and noise and provide smooth and consistent airflow. The indoor fan must have 3 fan speeds that may be selected by the user. The indoor discharge grille shall be designed to maximize airflow throughout the room. The grille shall be reversible to allow a change in the airflow directions. The grille openings shall be sized to prevent personal injury or damage to the unit.
The front cover shall incorporate dual air filters conveniently mounted in the front of the unit. The filters must be accessible without the removal of the front cover. The filters shall be made of anti-microbial material to prevent mold and bacterial growth. The filters shall be washable and reusable by cleaning with water or by vacuuming.
The chassis shall have a built-in damper capable of providing at least 75 CFM of fresh air into the conditioned area. A fine mesh screen shall filter the incoming fresh air and prevent insect entry. There must be a provision for locking the damper closed to insure a proper seal.

1.8 Outdoor Air Handling Section

The outdoor air section shall consist of a single injection molded fan shroud that incorporates the outdoor motor mount into a single piece for ease of service and assembly. The outdoor motor shall be totally enclosed, ball-bearing, permanently lubricated and directly drive the outdoor fan/slinger ring.

1.9 Controls

Covered controls shall be accessible in a compartment at least 7-1/2 inches wide with the controls no deeper than 1-1/4 inches in the opening to facilitate easy operation of the unit.
The unit controls shall feature a LED readout that can display either room temperature or set point temperature. The unit shall receive input from the digital control panel through push buttons labeled: 'Cool', 'Heat', 'High Fan', 'Med Fan', 'Low Fan', 'up arrow', 'down arrow', and 'Power'. When 'Off', the unit may be put directly into cooling or heating mode by pressing the 'Cool' or 'Heat' button.
The unit must have the following energy saving and convenience features built-in: quiet start/stop fan delay; fan cycle control for cooling and heating independently; room freeze protection; random compressor restart; and electronic temperature

limiting.

The PTAC must also offer the ability to be controlled by a remote wall-mounted thermostat without additional accessories. Low voltage inputs must include: C (common), R (24 volt power), Y (cooling), GL (fan low), GH (fan high), W (heat), and O (reversing valve on heat pump units only).
PTAC models shall use a single stage cool / single stage heat thermostat. PTHP models shall use a single stage cool / two-stage heat thermostat. An accessory thermostat must be available from the manufacturer. The thermostat must provide temperature set point, mode selection from cool, heat, and fan modes. The thermostat must also allow the selection of fan speed between high and low speed.
Other controls accessible without removal of the chassis shall include fan cycle switch, fresh air vent control, and emergency heat override switch (heat pump only).

1.10 **Electrical Connection**

All PTAC / PTHP units shall come from the factor with a power cord installed. All 230/208 volt power cords shall feature a leakage current detection device on the plug head. All units shall feature a 6-pin connector for removal of the power cord. The power cord shall be interchangeable to allow changes to the heater output based on the electrical requirements.

1.11 General Construction

The wall sleeve shall be constructed of 18-gauge galvanized zinc-coated steel. It shall be prepared by a process where it is zinc phosphate pretreated and sealed with a chromate rinse, then power coated with a polyester finish and oven cured for durability. The sleeve shall be shipped with a protective weatherboard and a structural center support, and be insulated for sound absorption and thermal efficiency. The grille or louver shall be shipped separately and made from stamped or extruded anodized aluminum. All louvers shall be in the horizontal plane.
The front panel shall attach firmly to the chassis by two hidden spring clips. As an option the cover may be attached by two screws to prevent tampering. The front panel will feature a contoured discharge with no sharp corners.

1.12 Corrosion Protection

The unit shall have corrosion-resistant fans, fan shroud and drain pan for corrosion protection and to prevent rust on the side of the building below the outdoor louver. The unit shall feature corrosion resistant materials and finishes to help prevent deterioration. The outdoor coil shall have Diamonblue corrosion protection consisting of hydrophilic coated fins to prolong the life of the coil in all applications including seacoast environments. All outdoor coils shall also have stainless steel endplates to eliminate rusting of the endplates.

1.13 Warranty

Provide warranty of one year on all parts and 5 years on the sealed refrigerant system including compressor, metering device, evaporator coil, condenser coil, reversing valve, check valve, and refrigerant tubing. Warranty coverage must include cost of parts, labor, and shipping charges.

1.14 Spare Replacement Filter Pack

Provide one set of spare filters for each unit installed.

1.15 **Accessories**

a. Deep wall sleeve extension.

Provide heat pump unit manufacture’s sleeve extension. Fabricate from galvanized zinc coated steel, powder coated with a polyester finish and cured in an oven for exceptional durability. Insulate wall sleeve for sound absorption and thermal efficiency. Provide one piece sleeve made to jobsite specific depth requirement to extend from existing outside air louver to proper location into the occupied space. Multiple sleeves or add-on sleeve extensions are not permitted.

b. Condensate Drain Kit

Provide 2 condensate drain kits per unit that attach to the underside of the wall sleeve for internal draining.

c. Air Baffle Kit
Provide air baffle kit to separate incoming and outgoing condenser air streams.

1.16 **Basis of Design**

Friedrich Model PDH12K, 11,800 BTUH cooling, 10,500 BTUH reverse cycle heating. Auxiliary heating coil, 5 KW. 208V, 1 Phase, 60 HZ.

1.17 Installation

Install units in accordance with manufacturer's instructions except as modified by these specification requirements. The design intent is to install the PTHP units properly, seal the existing outside air louver opening watertight, and to seal the PTHP unit wall sleeve against the aluminum closure panel watertight to prevent entry of blowing rain into the building.

Install 0.08 inches thick aluminum closure panel on inside of existing outside air louver. Cutout openings for condenser air intake and discharge. Fasten with #8 stainless steel sheet metal screws at 8 inches on center minimum. Install screws around openings if possible. Size closure panel to cover entire opening of louver at that location. Apply one thick coat of black bitumastic coal tar mastic to separate aluminum surface from other materials and to provide black color when viewed from outside the building. Provide total dry film thickness not less than 18 mils. Apply 2 inch wide x 1/2 inch thick soft gasket material to all perimeter edges to seal panel watertight against entry of blowing rain.

Install manufacture's wall sleeve with front to back slope to the outside. Slope must be between 1/4 and 3/8 bubble width (1/4 inch minimum drop measured at the back of the sleeve) to ensure water drains from the sleeve and the PTHP unit.

Install air baffle kit to separate incoming and outgoing condenser air streams. Baffles must extend to back of existing louver to provide proper air separation and prevent short cycling of condenser air. Increase baffle length as required.

Apply 1 inch wide x 1/2 inch thick soft gasket material to all perimeter edges on back of wall sleeve to seal sleeve watertight against aluminum panel and prevent entry of blowing rain.

Install 2 internal drains per unit. Install each drain 1/4 of the way from each side of the unit in the preferred drain area. Connect drains to existing drain pipe. Use smooth bore insulated drain hose to protect against

condensation forming on the outside of the hose. Use proper pipe fittings. Fasten hose to fittings with stainless steel worm screw clamps. Check piping for leaks and correct leaks as necessary.

End of Section

ATTACHMENT 5

SITE PHOTOGRAPHS

BASE BUILDING ROOF

VIEW OF THE BASE BUILDING ROOF WITH SOME OF THE PENETRATION

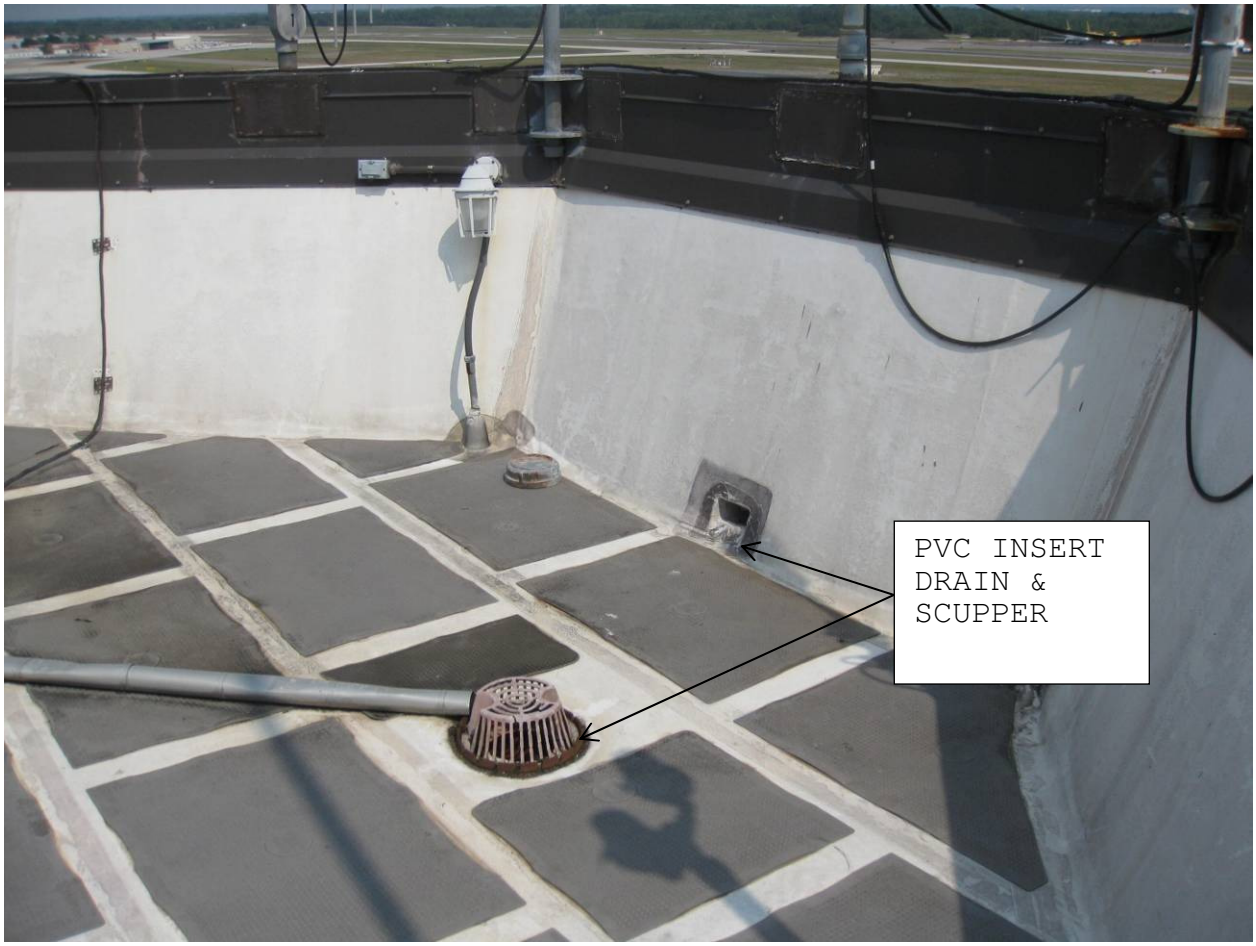
NORTH VIEW OF THE BASE BUILDING ROOF.

SOUTH EAST VIEW OF BASE BUILDING

VIEW OF THE CATWALK

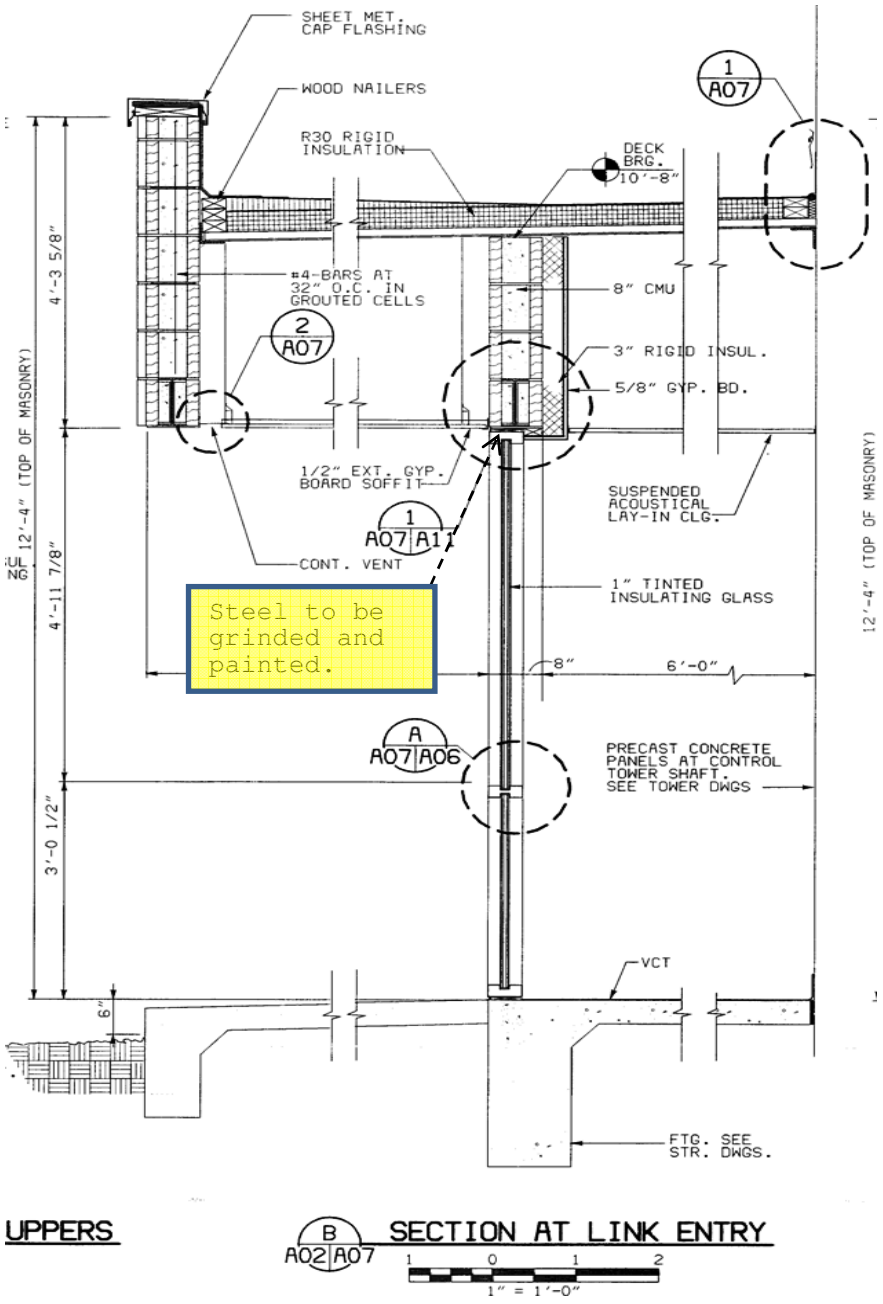
VIEW OF THE DETERIORATED THE CATWALK SURFACE AREA

CAB ROOF VIEW



CAB ROOF

TYPICAL VIEW OF THE ATCT FLOOR WALL UNIT
SCHEDULE FOR WATERPROOFING AND REPLACEMENT
ALTERNATE A



Base Building wall section

Wall section near window and PTHP units, for plywood and wall repair.

Base building column and steel.